

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE  
BOARD OF PATENT APPEALS AND INTERFERENCES**

Appl. No. : 10/500,502  
Appellant(s) : VRIES, Franciscus L. G., et al.  
Filed : 22 February 2005  
Title : SINTERED BODY AND ELECTRIC LAMP  
TC/A.U. : 1755  
  
Examiner : GROUP, Carl E.  
  
Atty. Docket : NL 020,012

**APPELLANT'S APPEAL BRIEF**

Board of Patent Appeals and Interferences  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Brief of Appellant follows a Notice of Appeal dated 16 January 2007, appealing the decision dated 16 October 2006 of the Examiner finally rejecting claims 1-6 of the application.

All requisite fees set forth in 37 CFR 1.17(c) for this Brief are hereby authorized to be charged to Deposit Account No. 14-1270.

REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of all rights in and to the subject application, Koninklijke Philips Electronics, N.V. of The Netherlands.

RELATED APPEALS AND INTERFERENCES

To the best of the knowledge of the undersigned, no other appeals or interferences are known to Appellants, Appellants' legal representatives, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-6 as originally filed, in unamended form, now stand finally rejected as set forth in the final Office Action dated 16 October 2006, and are the subject of this appeal.

STATUS OF AMENDMENTS

No amendment to the claims has been presented.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention relates to a sintered body of gastight polycrystalline aluminum oxide containing magnesium in oxidic form and a second metal M in oxidic form. (page 1, lines 1 and 2)

In the broadest aspect of the invention, the sintered body of aluminum oxide containing magnesium in oxidic form and a second metal in oxidic form further comprises zirconium in oxidic form, the zirconium calculated as  $ZrO_2$  being present in a quantity by weight of 50 to 600 ppm, the magnesium calculated as MgO being present in a quantity by weight of 50 to 1000 ppm, and the second metal M is selected from erbium, holmium, dysprosium and thulium, the second metal calculated as  $M_2O_3$  being present in a quantity by weight of 10 to 100 ppm. (page 1, lines 23-28; claim 1)

In a particular embodiment of the sintered body, MgO is present in a quantity by weight of 50 to 500 ppm,  $M_2O_3$  is present in a quantity by weight of 20 to 50 ppm, and  $ZrO_2$  is present in a quantity by weight of 200 to 500 ppm. (page 2, lines 8-13; claim 2)

In another advantageous embodiment of the sintered body, MgO is present in a quantity by weight of 50 to 500 ppm,  $M_2O_3$  is present in a quantity by weight of 30 to 50 ppm and  $ZrO_2$  is present in a quantity by weight of 200 to 400 ppm. (page 2, lines 14-17; claim 3)

The invention also relates to an electric lamp comprising a lamp vessel (2) of gastight polycrystalline aluminum oxide containing magnesium in oxidic form and a second metal M in oxidic form. (page 1, lines 3-5; figs. 1-3)

More particularly, the lamp vessel (2) of the electric lamp comprises the sintered body in accordance with claims 1, 2 and 3 of the invention. (page 4, lines 11 and 12; claim 4-6)

GROUND(S) OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are:

1. Claims 1-6 are rejected under 35 U.S.C. 102(a) or 102(e) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Scott et al. U.S. patent 6,639,362 (herein 'Scott');

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tiedt et al. U.S. patent 5,625,256 (herein 'Tiedt') further in view of Scott.

ARGUMENT

1. Are claims 1-6 anticipated by, or in the alternative, unpatentable over Scott?

Claims 1-6 are rejected under 35 U.S.C. 102(a) or 102(e) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Scott et al. U.S. patent 6,639,362 (herein 'Scott').

Scott discloses a high pressure discharge lamp with an arc discharge vessel comprised of alumina and the following dopants in parts per million: MgO: 50-1500; HfO<sub>2</sub>: 100-1500; ZrO<sub>2</sub>: 0-700; Y<sub>2</sub>O<sub>3</sub>: 0-300; Sc<sub>2</sub>O<sub>3</sub>: 0-1000; Dy<sub>2</sub>O<sub>3</sub>: 0-1000; Tb<sub>2</sub>O<sub>3</sub>: 0-1000; with the proviso that at least 5 ppm of M<sub>2</sub>O<sub>3</sub> be present.

See col. 2, lines 47-63. Preferably, at least 100 ppm  $ZrO_2$  is present. See col. 4, lines 42 and 43.

In contrast to the teachings of Scott, Appellant limits the amount of  $MgO$  to 1000 ppm, above which spinels undesirably form at the surface and in the bulk of the body. See page 2, lines 28-30 of Appellant's specification.

Spinel reacts with the filling of the lamp, causing properties such as lamp voltage, spectrum of the emitted light and/or color point, to change. This is particularly severe in lamps with unsaturated fillings, such as unsaturated high-pressure sodium (HPS) lamps. See page 2, lines 3-7 of Appellant's specification.

Further in contrast to Scott, who teaches that  $ZrO_2$  is an optional component, Appellant requires the presence of  $ZrO_2$ . This is based on the recognition that  $ZrO_2$  counteracts spinel formation. See page 2, lines 7 and 8 of Appellant's specification.

Further in contrast to the teachings of Scott, Appellant's second metal in oxidic form includes Er, Ho and Tl. This second metal regulates crystal growth, and limits exchange reactions with the filling of the lamp vessel.

Thus, Scott fails to anticipate claim 1, since:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Since Scott fails to disclose: (a) an upper limit of 1000 ppm for  $MgO$ ; (b) that  $ZrO_2$  is an essential rather than an optional component; and (c) that the second metal in oxidic

form includes Er, Ho and Tl, Scott fails to anticipate Appellant's claims.

Moreover, in specifically teaching: an upper limit of 1500 ppm for MgO; that ZrO<sub>2</sub> is an optional component; and that the second metal in oxidic form is selected from Y<sub>2</sub>O<sub>3</sub>, Sc<sub>2</sub>O<sub>3</sub>, Dy<sub>2</sub>O<sub>3</sub> and Tb<sub>2</sub>O<sub>3</sub>, Scott fails to suggest Appellant's claimed composition, and in fact leads the skilled artisan away from Appellant's claimed invention.

Accordingly, the rejected claims are neither anticipated by nor rendered obvious over Scott, and the rejections under 35 U.S.C. 102(a), 102(e) and 103(a) are in error and should be reversed.

In response to Appellant's prior argument that Appellant limits the amount of MgO to 1000 ppm, above which spinels undesirably form at the surface and in the bulk of the body, whereas Scott calls for up to 1500 ppm of MgO, the Examiner has responded that Scott's broader range encompasses Appellant's claimed range, making Appellant's claimed range at least obvious if not anticipated.

While a showing of overlapping ranges can establish a *prima facie* case of obviousness, Appellant is permitted to rebut such a *prima facie* case by showing the criticality of the claimed range. See, e.g., MPEP 2144.05 and *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Appellant's upper limit of 1000 ppm is clearly critical, since as taught, e.g., at page 2, lines 28-30 of Appellant's specification, above this limit, undesirable spinel formation occurs. Spinel reacts with the filling of the lamp, causing properties such as lamp voltage, spectrum of the emitted light and/or color point, to change. This is particularly severe in lamps with unsaturated fillings, such as

unsaturated high-pressure sodium (HPS) lamps. See page 2, lines 3-7 of Appellant's specification.

There is nothing in Scott which would lead the skilled artisan to limit the amount of MgO to 1000 ppm. On the contrary, Scott clearly teaches that MgO may range up to 1500 ppm, where spinels would form. Thus, while Scott's range is overlapping, Scott fails to suggest or render obvious Appellant's narrower critical range for MgO.

Regarding the question of anticipation, MPEP 2131.03 states:

In order for a showing of overlapping ranges to establish anticipation, the claimed range must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, ... it may be [concluded] that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims.

Since Scott fails to disclose that the amount of MgO should be kept below 1500 ppm to avoid spinel formation, Appellant's teaching that MgO should be kept below 1000 ppm to avoid spinel formation is clearly unexpected. Thus, Scott's range does not disclose Appellant's range with sufficient specificity to constitute an anticipation.

In response to Appellant's prior argument that Scott teaches that ZrO<sub>2</sub> is optional, whereas Appellant requires that ZrO<sub>2</sub> be present in the range of 50-600 ppm, the Examiner has responded that Scott teaches a preferred composition including at least 100 ppm ZrO<sub>2</sub>, citing col. 4, lines 42-43 of the reference.

However, Scott does not require the presence of  $ZrO_2$ , and provides no reason for its inclusion in the preferred composition.

In contrast, Appellant teaches that  $ZrO_2$  is required to counteract spinel formation. However, the amount of  $ZrO_2$  is critical, because too much would result in the formation of a zirconium-containing second phase, which would form on the inner surface of the lamp vessel, adversely affecting both light efficiency and the mechanical strength of the lamp vessel. See page 2, lines 7-13 of Appellant's specification.

Since Scott fails to appreciate the critical role of  $ZrO_2$ , Scott fails to teach Appellant's claimed range with sufficient specificity to constitute anticipation under Section 102, and also fails to suggest the criticality of Appellant's claimed range in a manner to constitute obviousness under Section 103.

In response to Appellant's prior argument that Scott fails to disclose oxides of erbium, holmium and thulium, the Examiner has responded that while this is true, nevertheless Appellant's claims also allow for oxides of dysprosium, which Scott does disclose.

However, the disclosure of only one member of a group is insufficient to anticipate the group, since as already stated:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Moreover, the disclosure of only one member of a



group, together with the lack of any teaching or suggestion which would lead the skilled artisan to the other members of the group, is insufficient to render the group obvious.

Since Scott fails to disclose: an upper limit of 1000 ppm for MgO; that ZrO<sub>2</sub> is an essential rather than an optional component; and that the second metal in oxidic form includes Er, Ho and Tl, Scott fails to anticipate Appellant's claims.

Moreover, in specifically teaching: an upper limit of 1500 ppm for MgO; that ZrO<sub>2</sub> is an optional component; and that the second metal in oxidic form is selected from Y<sub>2</sub>O<sub>3</sub>, Sc<sub>2</sub>O<sub>3</sub>, Dy<sub>2</sub>O<sub>3</sub> and Tb<sub>2</sub>O<sub>3</sub>, Scott fails to suggest Appellant's claimed composition, and in fact leads the skilled artisan away from Appellant's claimed invention.

Accordingly, the rejected claims are neither anticipated by nor rendered obvious over Scott, and the rejections under 35 U.S.C. 102(a), 102(e) and 103(a) is in error and should be reversed.

2. Are claims 1-6 unpatentable over Tiedt in view of Scott?

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tiedt et al. U.S. patent 5,625,256 (herein 'Tiedt') further in view of Scott.

Tiedt discloses a high-pressure discharge lamp having a ceramic discharge vessel of alumina doped with 100-800 ppm MgO, 200-1200 ZrO<sub>2</sub> and 10-300 ppm Y<sub>2</sub>O<sub>3</sub>.

Thus, the teachings of Tiedt and Scott are in conflict regarding both the identities and amounts of the dopants. For example, Tiedt's upper limit for MgO is only 800 ppm, versus Scott's upper limit of 1500 ppm. Further, Tiedt

requires the presence of  $ZrO_2$ , whereas Scott teaches that  $ZrO_2$  is optional.

Accordingly, with respect to  $MgO$  and  $ZrO_2$ , the teachings of Tiedt and Scott are in conflict, and the skilled artisan would not combine them in the manner suggested by the Examiner.

Both Tiedt and Scott agree on  $Y_2O_3$  as a dopant. However, Appellant does not claim  $Y_2O_3$  as a dopant. The Examiner has argued that Scott teaches that  $Dy_2O_3$  may be substituted for  $Y_2O_3$  as a dopant. However, neither Tiedt nor Scott teach or suggest Appellant's other claimed dopants, Er, Ho and Tl in oxidic form.

In response to Appellant's argument that the teachings of Tiedt and Scott are in conflict regarding both the identities and amounts of the dopants, the Examiner has responded that while the compositional ranges of the references are not identical, nevertheless there is substantial overlap in the ranges, making the references combinable.

However, in order for references to form an effective combination under Section 103, there must be some teaching or suggestion in at least one of the references which would motivate the skilled artisan to combine the teachings in a way to arrive at Appellant's claimed invention.

Scott teaches  $MgO$  with an upper limit of 1500 ppm, but provides no reason for this upper limit. In fact, Scott doesn't even explain the function of  $MgO$ . He does state at the end of the Background section of the specification that there is a need for an alumina arc tube with reduced tendency for sodium diffusion and/or binding, but never states that the claimed composition or any of its components meets this need.

Tiedt teaches an upper limit of 800 ppm for MgO, and states that above this limit, a secondary phase starts to develop which facilitates the diffusion of sodium into the outer bulb. However, Tiedt stresses that ZrO<sub>2</sub> and Y<sub>2</sub>O<sub>3</sub> must be jointly used with MgO, in order to obtain a mutual interaction which imparts characteristics to the ceramic material that clearly exceed the characteristics that might be expected as a result of the mere addition of these doping substances alone. See col. 3, lines 1-6.

In contrast, Scott teaches that ZrO<sub>2</sub> is only an optional component.

Since Tiedt is in conflict with Scott in several respects, including the upper limit of MgO, but most important, the need to use ZrO<sub>2</sub> and Y<sub>2</sub>O<sub>3</sub> in combination with MgO, the references cannot be combined in the manner urged by the Examiner, despite the overlapping ranges disclosed.

In response to Appellant's argument that neither Tiedt nor Scott teach or suggest Appellant's other claimed dopants, Er, Ho and Tl in oxidic form, the Examiner has stated that not every member of a Markush group needs to be found to meet the limitations of the claims.

However, where only one member of a four-member group is found, and there is no teaching or suggestion in the references which would lead the skilled artisan to the other three members of the group, that one member cannot be said to render obvious the choice of the other three members of the group.

Both Scott and Tiedt are utterly lacking in any teaching or suggestion which would lead to the choice of Er, Ho and Tl in oxidic form. Thus, the references fail to render obvious Appellant's Markush group.

Accordingly, the rejected claims are patentable over the combined teachings of Tiedt and Scott, and the rejection under 35 U.S.C. 103(a) is in error and should be reversed.

#### SUMMARY

In summary, neither Scott nor Tiedt teach or suggest a sintered alumina body having the particular compositional ranges claimed by Appellant.

While both Scott and Tiedt teach some of the constituents claimed by Appellant, and teach ranges for some of these constituents which are sometimes partially overlapping, neither reference contains any teaching or suggestion which would lead the skilled artisan to Appellant's claimed invention.

Moreover, Appellant's claimed ranges of MgO and ZrO<sub>2</sub> are critical for the reasons provided in Appellant's specification, and both Scott and Teidt fail to discuss or appreciate the Appellant's reasons for this criticality, and thus cannot lead the skilled artisan to Appellant's claimed subject matter.

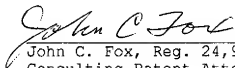
Such appreciation could only be had by resort to hindsight gained from Appellant's own teachings, and such hindsight is not permitted in judging obviousness under Section 103.

#### CONCLUSION

In view of the foregoing, Appellant respectfully requests that the Board reverse the rejections of record, and direct the Examiner to allow all of the pending claims, and to

otherwise find the application to be in condition for allowance.

Respectfully submitted,

A handwritten signature in cursive script, reading "John C. Fox". The signature is written in dark ink and is positioned above the printed name and title.

John C. Fox, Reg. 24,975  
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APPENDIX

CLAIMS ON APPEAL

1. A sintered body of gastight polycrystalline aluminum oxide containing magnesium in oxidic form and a second metal M in oxidic form, characterized in that the second metal M is selected from erbium, holmium, dysprosium and thulium, and the aluminum oxide further comprises zirconium in oxidic form, magnesium calculated as MgO being present in a quantity by weight of 50 to 1000 ppm, the second metal calculated as  $M_2O_3$  being present in a quantity by weight of 10 to 100 ppm, and zirconium calculated as  $ZrO_2$  being present in a quantity by weight of 50 to 600 ppm.

2. A sintered body as claimed in claim 1, characterized in that magnesium calculated as MgO is present in a quantity by weight of 50 to 500 ppm, the second metal calculated as  $M_2O_3$  is present in a quantity by weight of 20 to 50 ppm, and zirconium calculated as  $ZrO_2$  is present in a quantity by weight of 200 to 500 ppm.

3. A sintered body as claimed in claim 2, characterized in that magnesium calculated as MgO is present in a quantity by weight of 50 to 500 ppm, the second metal calculated as  $M_2O_3$  is present in a quantity by weight of 30 to 50 ppm, and zirconium calculated as  $ZrO_2$  is present in a quantity by weight of 200 to 400 ppm.

4. An electric lamp comprising a lamp vessel of gastight polycrystalline aluminum oxide containing magnesium in oxidic

form and a second metal M in oxidic form, characterized in that the lamp vessel comprises a sintered body as claimed in claim 1.

5. An electric lamp as claimed in claim 4, characterized in that the lamp vessel comprises a sintered body as claimed in claim 2.

6. An electric lamp as claimed in claim 4, characterized in that the lamp vessel comprises a sintered body as claimed in claim 3.

EVIDENCE APPENDIX

(none)



RELATED PROCEEDINGS APPENDIX

(none)